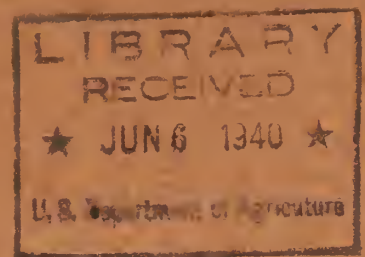


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UNITED STATES DEPARTMENT OF AGRICULTURE
WEATHER BUREAU

**FIRE WEATHER FORECAST
TERMINOLOGY**

1940



UNITED STATES DEPARTMENT OF AGRICULTURE

WEATHER BUREAU

Washington, D. C., April 1, 1940

The terminology prescribed herein is for use in connection with the weather forecasts issued as an aid in the protection of forests from fire, and will become effective May 1, 1940; to replace the first edition dated October 31, 1937.

The primary purpose of the terminology is to define the expressions to be used in such forecasts, in order to assure uniform understanding as to their meanings. It is expected that officials in charge of the various fire weather districts will confine themselves to the prescribed terms as far as it is practicable to do so.

F. W. Reichelderfer,

Chief of Bureau.

M. H. JUL 22 1940

EXPLANATION

ORDER OF ARRANGEMENT OF ITEMS IN FORECASTS

Predictions of the various items covered in fire weather forecasts will be given in the order specified below. Their arrangement with respect to successive periods, however, is left to the discretion of the forecaster. If specific mention of some item is not made in the forecast, no material change from existing conditions is implied.

- (a) Weather
- (b) Temperature
- (c) Relative humidity
- (d) Wind direction and velocity

Supplementary information when required:

- (e) Visibility
- (f) Danger statements, if any
- (g) Special advices (fuel moisture, cautionary remarks or miscellaneous)

TYPES OF FORECASTS

The following types of forecasts are authorized, and will be used in whole, in part, or combined, as circumstances warrant.

General Outlooks Covering expected conditions for 3 to 5 days in advance. They will be issued in generalized language, and then only when circumstances warrant.

Daily Forecasts Covering expected conditions for the first 12 hours in as much detail as practicable, and for succeeding 12-hour periods, not in excess of a total of 48 hours, in lesser detail.

Special Localized Forecasts Issued for short periods (3 to 12 hours) in as much detail as circumstances warrant. They are issued when emergency conditions arise, or when required.

PERIODS COVERED BY FORECASTS

A. M. forecasts First period, time of release to 7:30 p.m. of current (local time) day, termed "Today".
Second period, 7:30 p.m. current day to 7:30 a.m. following day, termed "tonight".
Third period, 7:30 a.m. to 7:30 p.m. of following day, (give name of day).

PERIODS COVERED BY FORECASTS -- (continued)

P. M. forecasts First period, time of release to 7:30 a.m. next morning, termed "Tonight".
Second period, 7:30 a.m. to 7:30 p.m. tomorrow (give name of day).
Third period, 7:30 p.m. tomorrow to 7:30 p.m. second day ahead, (give name of day).

On occasions more restrictive time periods may be used as follows, and with time definitions as indicated. (local time).

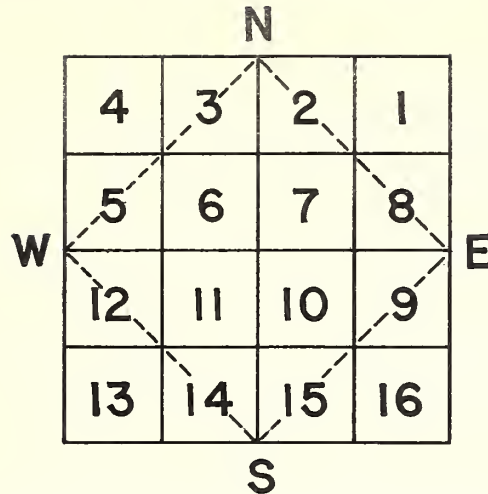
Early morning.....midnight to sunrise
*Forenoon.....sunrise to noon
*Afternoon.....noon to sunset
Mid-day.....10 a.m. to 2 p.m.
Middle night.....10 p.m. to 2 a.m.

* These terms may be modified by "early" or "late" as appropriate.

AREAS COVERED BY FORECASTS

Forecast statements in accordance with term definitions given in pages 4 to 11, inclusive, are intended to apply to the area as a whole unless otherwise indicated. Modifying terms may be used to indicate the parts of the area over which occurrence is expected, as follows:

General (ly)	Widespread, all or most of the area.
Local (ly)	Limited, or scattered parts of the area
Slopes	Appropriate sides of major mountain divides, the whole of the slope from toe to ridge; given direction names such as "west", "north", "south-east", etc.
Portions	<p>Any area of such size or peculiarities as to justify subdivision for forecast purposes may be divided into portions and given directional names; or reference may be made to prominent topographic or other readily identifiable features. Small areas <u>ordinarily</u> will not be divided.</p> <p>Directional names are assigned to subdivisions of a general area obtained by dividing that area into approximately equal parts by North-south, and East-west lines, and further dividing these quadrants by supplementary lines as shown on the following diagram. While irregularly shaped areas cannot be divided into symmetrical portions, this method of division can be followed generally for all forest areas.</p>



Names assigned to the various portions are defined below in terms of the numbered areas on the above diagram.

<u>Portion designation</u>	<u>Areas included (see above diagram)</u>
NORTH	1, to 8, inclusive
SOUTH	9 to 16, inclusive
EAST	1, 2, 7, 8, 9, 10, 15, 16
WEST	3, 4, 5, 6, 11, 12, 13, 14
CENTRAL	6, 7, 10, 11
NORTHWEST	3, 4, 5, 6
NORTHEAST	1, 2, 7, 8
SOUTHWEST	11, 12, 13, 14
SOUTHEAST	9, 10, 15, 16
NORTH CENTRAL	2, 3, 6, 7
SOUTH CENTRAL	10, 11, 14, 15
EAST CENTRAL	7, 8, 9, 10
WEST CENTRAL	5, 6, 11, 12
EXTREME NORTH	1, 2, 3, 4
EXTREME SOUTH	13, 14, 15, 16
EXTREME WEST	4, 5, 12, 13
EXTREME EAST	1, 8, 9, 16
EXTREME NORTH CENTRAL	2, 3
EXTREME SOUTH CENTRAL	14, 15
EXTREME WEST CENTRAL	5, 12
EXTREME EAST CENTRAL	8, 9

ALTITUDE ZONES USED IN FORECASTS

Highest.....Mountain peaks or high plateaus
 Higher.....Upper 25% of the area
 Intermediate.....Middle altitude zone
 Lower.....Lower 25% of the area
 Lowest.....Valley floor or low plains

FORECAST TERMS AND DEFINITIONS

WEATHER

Clear	<u>No precipitation.</u> Sky free or practically free from clouds. (Average for period less than 1 tenth of sky covered)
*Scattered	<u>No precipitation.</u> Sky partially clouded (Average of 1 to 5 tenths of sky covered with clouds)
*Broken	<u>No precipitation.</u> Sky partially clouded (Average for period more than 5 but not more than 9 tenths of sky covered)
*Overcast	<u>No precipitation.</u> Sky completely overcast or nearly so. (Average for period more than 9 tenths)
Generally fair	Considerable variation in cloudiness but with tendency for stable, settled weather. Possibility of very light precipitation in widely scattered localities, but no precipitation over most of area.
*Increasing cloudiness	<u>No precipitation,</u> but progressive increase in cloudiness, either in amount of sky covered, or in density of cloud layers.
*Decreasing cloudiness	<u>No precipitation,</u> but progressive decrease in the amount of sky covered, and/or density of clouds.
Unsettled	Precipitation unlikely, but some possibility of light showers in small, scattered areas. Considerable cloudiness with sky occasionally covered with dark, lowering clouds, and tendency toward instability.
Clearing	Precipitation to end during the time period specified, followed shortly thereafter by clearing sky.

* In predictions of cloudiness, the following terms may be used to indicate the class of cloudiness:

High)
Middle) See cloud booklet
Low)

WEATHER (continued)

Foggy	<u>No precipitation</u> , but condensation on surface objects. May be modified by terms "Light", "Moderate", "Thick" or "Dense"; or may be expressed as " <u>Fog and/or low clouds</u> " when uncertainty exists whether one, the other or both may occur.
*Rain or Snow	<u>Precipitation of comparatively long duration</u> as distinguished from showers or flurries. Precipitation expected over a major portion of the area.
*Occasional Rain or snow	<u>Precipitation at infrequent intervals and not prolonged</u> , but widespread.
*Intermittent Rain or snow	<u>Precipitation of more or less general and prolonged character</u> , but frequently interrupted for short periods.
*Local Rain or Snow	<u>Precipitation of comparatively long duration over limited portions of the area.</u>
*General Rain or Snow	<u>Widespread precipitation of prolonged duration</u> and in amount sufficient to materially reduce fire danger.
Showers or Flurries	<u>Precipitation intermittent and of short duration.</u> May be modified by the terms "General" or "Local" and/or by terms given below.
*Drizzle	<u>Precipitation consisting of numerous tiny droplets.</u>
Dew or Frost	<u>Widespread liquid or frozen condensation on surface objects.</u> May be modified by the terms "Light" or "Heavy".
*In precipitation forecasts, the following modifying terms may be used:	
Very Light	Less than .03" precipitation.
Light	Less than .10" precipitation.
Moderate	Between .10" and .50" precipitation.
Heavy	More than .50" precipitation.
Very Heavy	More than 1.00" precipitation

If a modifying term is not used, the amount expected is indefinite, but a fall of at least .02" rain or .2 inches snow is implied.

THUNDERSTORMS

Lightning (thunder may or may not be heard) in connection with cumulus type clouds. Precipitation occurring in the storm may or may not reach the ground. Any of the following terms relating to intensity of the storm, area affected, size of disturbance, amount of precipitation, height of clouds, or chance of occurrence may be used in thunderstorm forecasts.

Terms relating to:

<u>Intensity</u>	Mild	Less than average intensity
	Moderate	Average storm intensity
	Severe	Considerably more intense than usual
<u>Extent</u>	Local	Storms affecting about 30% or less of area
	Scattered	Storms affecting between 30% and 70% of area
	General	Storms affecting about 70% or more of area
<u>Precipitation</u>	Very wet	More than 1.00 inch accompanying rainfall.
	Wet	More than .50 inch accompanying rainfall.
	Moist	.10 to .50 inch accompanying rainfall.
	Dry	Less than .10 inch accompanying rainfall
	Very Dry	Less than .03 inch accompanying rainfall.
<u>Cloud Base</u>	The elevation of thunderstorm cloud base may be expressed in thousands of feet above sea level, considering the average elevation over the storm area and for the storm day as a whole.	
<u>Chance of Occurrence</u>	Possibly	40% to 60% chance of occurrence
	Probably	50% to 80% chance of occurrence
An unqualified thunderstorm forecast indicates better than 80% chance of occurrence.		

TEMPERATURE
RELATIVE HUMIDITY
FUEL MOISTURE
and
WIND VELOCITY

(For modifying terms see tables on page 9).

Predictions of these elements may be made in terms of expected changes, or by quoting specific values. In the former case, changes in general will imply a comparison with values exactly 24 hours previous, but maximum and minimum values on successive days will be compared directly with each other.

TEMPERATURE

Terms used in predicting a change in temperature level

Warmer Higher temperatures by 6° F. or more.

Colder Lower temperatures by 6° F. or more.

Terms relating to a progressive temperature change.

Rising Temperatures becoming progressively higher when compared with corresponding times 24 hours previous (at least 6° F. lower expected by end of period)

Falling Temperatures becoming progressively lower when compared with corresponding times 24 hours previous (at least 6° F. lower expected by end of period)

RELATIVE HUMIDITY or
FUEL MOISTURE

Terms related to change in humidity or moisture level.

Higher Higher by an amount exceeding the limit of "little change".*

Lower Lower by an amount exceeding the limit of "little change".*

Terms related to a progressive change in level.

Rising or Humidities or fuel moisture values becoming
Falling progressively higher or lower when compared with corresponding times 24 hours previous (Differences expected to exceed the limit of "little change" by end of period)*

See tables on page 9 for limits of "little change"

WIND VELOCITY

Terms relating to change in wind velocity

Stronger	Winds stronger by at least 5 m.p.h. than 24 hours previous
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Lighter	Winds lighter by at least 5 m.p.h. than 24 hours previous
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Terms relating to a progressive change in wind velocity

Increasing	Winds becoming progressively stronger during period.
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Diminishing	Winds becoming progressively lighter during period.
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Gusty	Rapid and wide variations in force in short time intervals. May be modified by the terms "Somewhat", "Moderately" or "Very".
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Squally	Recurrent blasts of longer duration and less frequent than "gusty", and from a fairly steady direction.
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The forecaster may at his discretion specify wind velocities in miles per hour when the forecast is not intended for telegraphic distribution.

MODIFYING TERMS FOR TEMPERATURE, RELATIVE HUMIDITY, FUEL
MOISTURE AND WIND VELOCITY

Since predictions of these elements are all made in terms of changes, or of indicated specific values, the same modifying terms may be used for all these elements. Accordingly, definitions of such terms as they relate to each element are given in the following tables.

The first two terms in each group listed as relating to specific changes (warmer, colder, higher, lower, etc.) may be modified by terms given in the following table, thus specifying the amount of expected change.

Modifying term	Temperature	Relative Humidity	Indicated * Fuel Moisture	Wind Velocity
Slightly	1° to 5° F.	1% to 5%	0.6% to 1.5%	1 to 5 mph
Somewhat	6° to 10° F.	6% to 10%	1.6% to 2.5%	6 to 10 mph
Materially	11° to 15° F.	11% to 15%	2.6% to 3.5%	11 to 15 mph
Considerably	16° to 20° F.	16% to 20%	3.6% to 6.5%	16 to 20 mph
Decidedly	21° to 30° F.	21% to 30%	6.6% to 9.5%	21 to 30 mph
Much	31° F. or more	31% or more	9.6% or more	31 mph or more
Little change	5° or less	5% or less	0.5% or less	5 mph or less

* Percentage values given are based on $\frac{1}{2}$ " indicator sticks or similar devices in use at fire danger stations; and do not refer to the moisture content of actual forest fuels in place.

The last two terms in each group, listed as relating to progressive changes (rising, falling, etc.) may be modified by the terms

Slowly or

Rapidly to specify the expected rate of change.

Maximum or Minimum The forecaster may indicate his estimate of maximum or minimum values for the period by quoting specific figures; or he may indicate the average values for the period by using the terms given in the following table:

Term	Temperature	Relative Humidity	Indicated Fuel Moisture	Wind Velocity Term Values
Very High	100° F. or more	Over 80%	25% or more	Calm Less than 1 mph
High	90° to 100° F.	61% to 80%	21% to 25%	Very light 1 - 3 "
Moderately high	80° to 90° F.	51% to 60%	16% to 20%	Light 4 - 7 "
Moderate	65° to 80° F.	41% to 50%	10% to 15%	Gentle 8 - 12 "
Moderately low	50° to 65° F.	31% to 40%	7% to 9%	Moderate 13 - 18 "
Low	35° to 50° F.	21% to 30%	5% to 6%	Fresh 19 - 24 "
Very low	Below 35° F.	11% to 20%	3% to 4%	Strong 25 - 38 "
Acutely low	10% or less	2% or less	Gale 39 - 54 "
				Whole gale 55 - 75 "
				Hurricane Over 75 "

WIND DIRECTION

Wind direction will ordinarily be specified to eight points of the compass FROM which the average regional wind is expected to blow. The direction indicated will embrace an arc of 45° or $\frac{1}{8}$ circle centered on the direction quoted. The predicted wind direction is that of the regional wind, from which there may be wide local variations due to topographic irregularities. It is possible to make allowances for such local variations only in specific forecasts for small areas.

North	Southeast	West
Northeast	South	Northwest
East	Southwest	

Composite direction indications limited to adjacent directions and covering an arc of 90° may be used, such as "North to northeast", "Southeast to South", etc., using the above terms as defined.

Another general direction classification covering an arc of 90° may be used as follows:

Northerly	Southeasterly	Westerly
Northeasterly	Southerly	Northwesterly
Easterly	Southwesterly	

Terms indicating a change of direction

Veering	A progressive change in direction in a clockwise sense
Backing	A progressive change in direction in a counter-clockwise sense.
Becoming	Indicating a change from one to another specified wind direction.

Topographic winds:

Upslope	A topographic wind due to surface heating during the day, blowing upslope at all points. Commonly occurs during daylight hours, reaching its maximum force usually during mid-afternoon.
Downslope	A topographic wind due to nocturnal cooling and blowing downslope, reaching its maximum force during early morning hours. Most noticeable in valleys, coves, and other natural drainage channels.
Eddies	Eddies in the generally-prevailing wind flow produced mechanically to the leeward of mountain peaks, ridges, etc. May have vertical or horizontal components, but direction is generally different from the regional wind.

WIND DIRECTION (Continued)

Wind direction terms may be modified as follows:

- | | |
|------------|--|
| Variable | Uncertain and irregular -- usually subject to slow to moderate changes of varying magnitude. |
| Changeable | Uncertain and irregular changes of direction of a more decided nature and magnitude than "Variable". |
| Mostly | A modifier used when winds will be subject to some variability, to indicate what direction will predominate. |

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